GEOGRAPHIC NEWS BULLETINS

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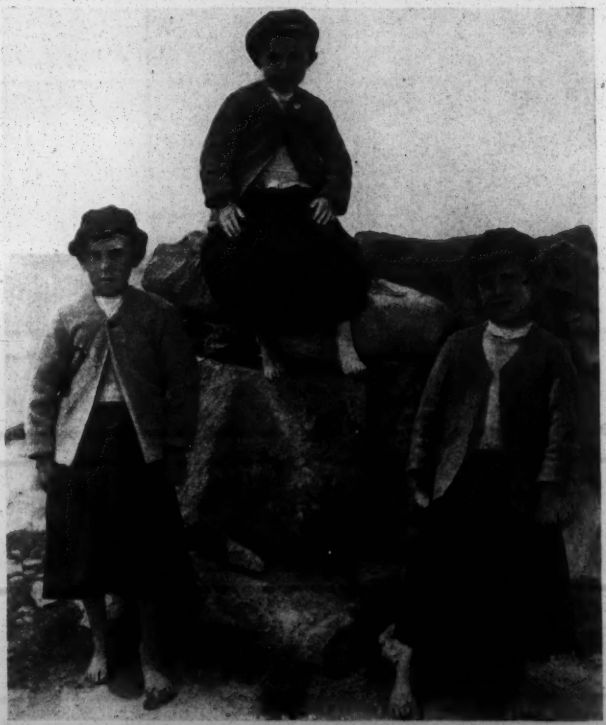
Contents for Week of March 16, 1931. Vol. X. No. 4.

1. Arabia's Blank Spot Explored at Last.
2. Pisa's Top-Tipped Tower To Be Made Tiptop.
3. Crete: Where the Cities Once Shunned the Sea.
4. Some Strange Forms of Nature's Fireworks.
5. County Donegal—Irish Tweeds and Steamer Rugs.



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WHERE LITTLE BOYS WEAR SKIRTS

In some parts of the Connemara coast, Ireland, boys up to 12 years old are sometimes dressed in red petticoats by superstitious parents to deceive evil spirits, who are supposed to run away with male children, but not with girls. (See Bulletin No. 5).

HOW TEACHERS MAY OBTAIN THE BULLETINS

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Arabia's Blank Spot Explored at Last

HUGE blank spots existed on the maps of most of the continents a half century ago. In recent years nearly all of them have grown smaller or have completely disappeared as the explorer and the surveyor have advanced. The great Southern Desert of Arabia, the Roba el Khali, remained the largest blank spot outside the Polar regions until a few weeks ago when Bertram Thomas, a British explorer, crossed it by camel caravan.

The desert, covering almost a third of the great Arabian peninsula, had never been seen, except at its rim, by white men. In fact, so desolate has the great desert been found to be by the few adventurers who have pushed to its well-guarded edges, that it has been seriously questioned whether natives had been able to penetrate into its heart since the time, probably many thousands of years ago, when climatic changes gradually made it into a sea of almost sterile sand. It is a vast ellipse which is roughly 800 miles across from east to west, and 600 miles from north to south.

Guarded by Both Nature and Man

All around this Arabian no-man's land, the forces of civilization have played; steamers traverse the Red Sea, the Indian Ocean, and the Persian Gulf; airplanes plying between Egypt and India have flown for years a few hundred miles to the north; great pilgrim caravans and desert armies have crossed the peninsula near its center—but always north of the dread sandy waste. Loosely organized political units hem in the desert area, with boundary lines hazy. On the north and west is the territory of the greatest Arabian state, the kingdom of Hejaz and Nejd. On the southeast is Yemen.

The Hadramaut, a narrow coastal strip under British protection, touches the desert on the south. The crescent-shaped, independent state of Oman, also a coastal territory, curves around the eastern and southeastern edges of the desert.

Waste of Sand Dunes

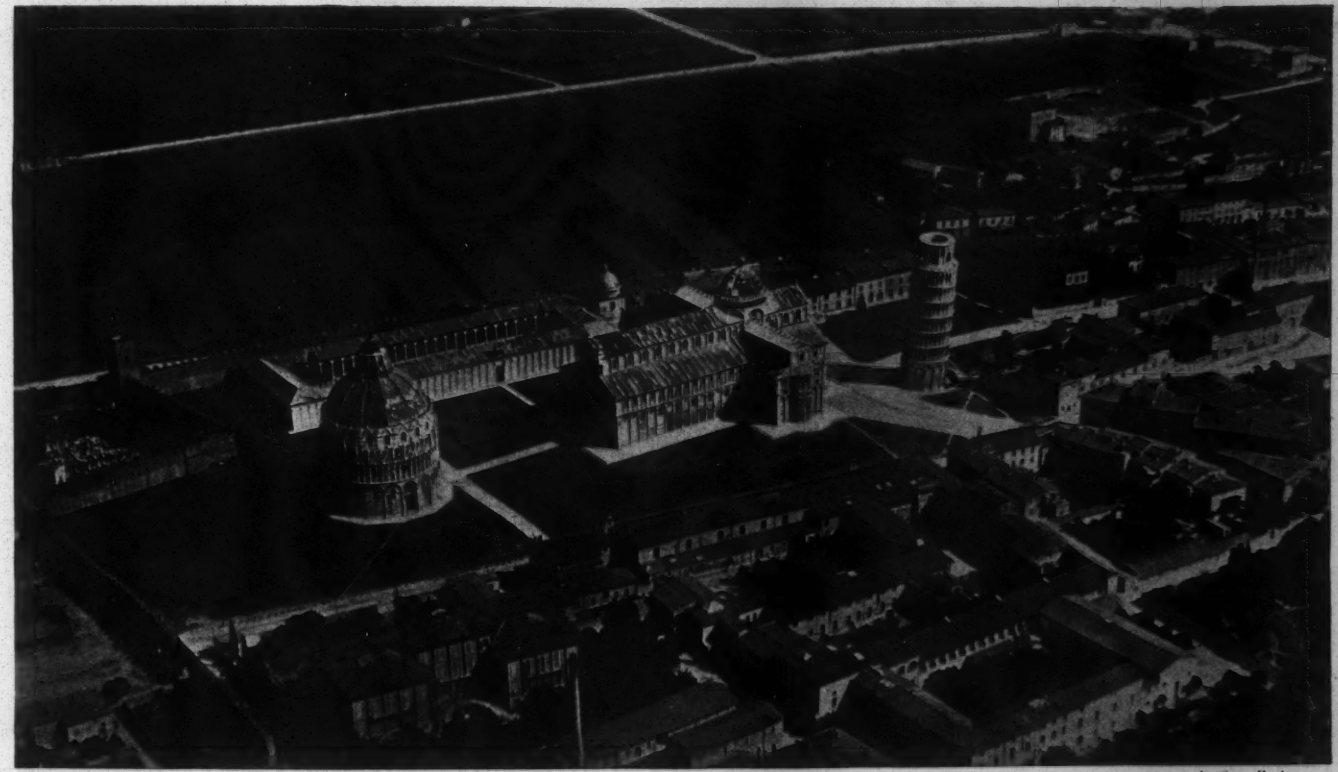
Both Nature and man have guarded the Roba el Khali against explorers. Mountains rim it on the east and south, and secondary deserts hem it on the north. The main part of the Southern Desert has been assumed to consist of a vast waste covered with sand dunes; but before this region of shifting sands can be reached, a six-day journey must be made—in the south and east, at least—over an almost sterile sandstone steppe. Water supplies are hardly anywhere in reach for a final dash into the sandy desert.

All around the outer rim of the desert area are tribes that have had practically no contact with outside civilizations, and are even independent of control from the nearest states. They guard their few wells and water holes jealously and in most cases look upon travelers from the outside world as meddlesome trespassers meriting death.

Bulletin No. 1, March 16, 1931.

Note: Areas of Arabia near the Great Southern Desert are described and pictured in the following articles in the *National Geographic Magazine*: "The Flower of Paradise" (the Khat plant, Yemen), August, 1917; "The Rise of the New Arab Nation," November, 1919; "A Visit to Three Arab Kingdoms," May, 1923; and other articles which may be found by consulting the Cumulative Index to the *National Geographic Magazine* in your school or public library.

See also "Jidda, Gateway to Industrial Revolt In the Desert" in the GEOGRAPHIC NEWS BULLETIN, January 26, 1931.



Photograph courtesy of Royal Italian Embassy

PISA'S LEANING TOWER IS PART OF A CATHEDRAL CLOSE (YARD)

The beautiful round structure to the left is the 12th-13th century Baptistery, built almost entirely of white marble. In the center is the Cathedral, and to the right of it the famous Leaning Tower, one of the Seven Wonders of the medieval world. It was originally intended to be but a belfry for the Cathedral. Its slanting defect brought it fame (See Bulletin No. 2).

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Pisa's Top-Tipped Tower To Be Made Tiptop

PISA'S top-tipped tower will soon be placed in tiptop condition.

Pisa's growing inclination is due to the fact that its foundations are laid in clay and sand. Plans are now under way to inject hardening material into the soil under Italy's leaning wonder, and so to fortify the base. For many years pumps have been disposing of water from springs which surround its foundations.

A commission appointed by Premier Mussolini found that ground treated with a solution of sulphate of aluminum and silicate of sodium, placed in testholes, withstood heavy iron weights much better than areas not treated with the solution. The commission strongly recommended that steps be taken soon to cement the sub-soil by injecting this chemical preparation.

Now Has a 16-foot Slant

In ten years the famous tower increased its inclination by a little more than a third of an inch. A hundred years ago the tower leaned 15 feet in 179 feet, and now it has attained a 16-foot slant. But further leaning will be averted by the proposed reinforcements.

The builders of the Tower did not set out to construct a leaning wonder. There is an oft-told story that a co-builder planned it to be crooked in ironic commemoration of the fact that he was a hunchback.

This tale has since been relegated to folklore. Bonnano and William of Innsbruck started it straight but the foundations failed to reach firm soil, the Tower began to tilt when the second story was put on, and the workers were so frightened that for years progress was delayed.

The structure was begun back in the year 1173, when campanile construction was as popular among Italian cities as skyscraper building is among American cities to-day.

Mark Twain Climbed It

Mark Twain climbed the 293 steps to the bell tower and the exertion prompted him to write that the Leaning Tower is "the height of four ordinary three-story buildings and is a very considerable altitude for a tower of uniform thickness to aspire to, even when it stands upright."

The perilous point to which Mark Twain crawled may have been the same spot Galileo sought in order to perform an experiment which caused as much controversy in the scientific world of his day as the Einstein (relativity) theory does to-day.

Galileo's Experiments

Galileo dropped a huge, heavy ball and a light ball. Both hit the marble pavement below the tower at the same instant. Previously it had been taken for granted that Aristotle was right in thinking a heavy object fell faster than a light one.

Continuing his experiments Galileo also watched a lamp swinging in the cathedral next door to the Leaning Tower and thus worked out, while still in his early twenties, the law of the pendulum.

The stabilization of the Tower may encourage the more frequent ringing of the seven huge bells hung in the top story. Each of these bells has a name and the oldest bears the inscription, "Locteringus of Pisa made me in A.D. 1262."

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AN ELECTRICAL STORM AT NIGHT OVER THE GRAND CANYON

The vivid flashes of lightning, and the thunder they create, might lead a person from Mars to believe that this force of Nature dug the mighty chasm of the Colorado. But all the work was done by irresistible drops of water. For long ages, clouds have discharged their burdens in the drainage basin of the river. Each cloud-born drop has taken its toll of silt grain or salt molecule and has gone its seaward way (See Bulletin No. 4).

Form for Renewal of Bulletin Requests

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Crete: Where the Cities Once Shunned the Sea

THE Isles of Greece still cast their spell on lovelorn swains. In May, some 500 Cretan bachelors from all parts of the United States will make a pilgrimage to their native land of Crete to claim brides who have been chosen by mutual exchange of photographs and letters.

Sail south from Piraeus, port of Athens, skirt the islands of Melos and Antimelos of the Cyclades group, and after 15 hours the mountainous profile of Crete comes into view.

Dominated by Mountains

The island has an area of about 3,300 square miles, almost equal to that of Delaware and Rhode Island combined. It is 160 miles long and varies in width from 35 to 7½ miles.

The more accessible sections of Crete are now covered with a network of fairly important highways, but in remote districts the traveler must use the traditional means of transportation, donkey or mule, over trails or uneven paths.

The whole island is dominated by the mountains which intersect it. They include the Lasithi range in the east, the Psiloriti, with Mount Ida near the center of the island, and to the west the White Mountains, locally, and rightly, named the "Desert of Stone."

Lines of Windmills

On a broad, elevated pass one sometimes sees a straight line of windmills, occasionally as many as twenty or more, each placed in a specially advantageous position to catch all the wind which the large wings require. The peasants from the villages climb up to them with their donkeys laden with grain. On the other hand, water mills are built along the steep mountain slopes in the ravines. The mills run only in winter, for during the summer there is no rain.

While Crete has an extremely heavy rainfall, it is limited to the wet season, which commences in October or November. The water accumulates and rushes down the mountains in violent torrents; it penetrates the soil and circulates through a vast network of limestone grottoes. It was in these grottoes, now a fairyland of stalactites and stalagmites, that the first inhabitants of the island established the worship of their gods.

Formerly, all habitation ended and all cultivation ceased at a certain distance from the sea, and most villages to-day are located in a zone somewhat away from the coast; for, though the sea is the purveyor of provisions and the best road for travel, it was also the haunt of pirates of old.

Canea, the Capital

Canea, surrounded by Venetian ramparts, is the capital of Crete; it is situated in the western part of the island.

Candia, farther to the east and also on the northern shore, is the only other city of commercial importance. During the Venetian occupation of the island this stronghold was known as Megalo Castro (Great Fortress); but many centuries before the Venetians held sway in Crete and before the Saracens left their impress, the inhabitants of the island had established a trading station at this

The bells now are rung only three times each year because it is feared their vibrations may jar the structure.

Bulletin No. 2, March 16, 1931.

Note: Pisa is only one of many fascinating cities in the Italian peninsula. In their history and traditions we find much that is related to our own cities. Teachers and students wishing material about Italy, its towns, traditions and people, will find up-to-date text and illustrations (many in natural color) in the following articles in the *National Geographic Magazine*: "The Perennial Geographer," October, 1930; "Stone Beehive Homes of Italian Peasants," February, 1930; "Holidays among the Hill Towns of Umbria and Tuscany," and "Man and Nature Paint Italian Scenes in Prodigal Colors," April, 1928; and "Under Radiant Italian Skies," August, 1926. For supplementary reading see also: "Sicily—Island of Vivid Beauty and Crumbling Glory," October, 1927; "The Island of Sardinia," January, 1923; and other articles which may be found by consulting the Cumulative Index to the *National Geographic Magazine* in your school or public library.

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CAMEL AND CALF, ARABIA

In the less arid regions around the edges of the Great Southern Desert, where there is enough rain at some seasons for a sparse growth of herbage, but no drinking water, the few Bedouins subsist on camels' milk (See Bulletin No. 1).

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Some Strange Forms of Nature's Fireworks

NATURE'S lightning is weak compared to that made by man. The most powerful stroke of wild lightning ever measured would run New York's city power lines only half a second.

A bolt of Nature's best, measuring some 5,000,000 volts, was caught recently on an Arkansas electric line between Camden and South Magnolia, and was measured, photographed and classified by scientists. The 5,000,000-volt stroke of lightning equaled about 15,000,000 watts. Eighty times this amount of power flowed over the lines of the New York Edison Company at 5 p. m. on December 23, during the hour of the highest peak load of 1930. If you like big figures here is the New York current then measured—1,247,800,000 watts.

St. Elmo's Fire, or Corpse Candles

Bolt lightning is only one of Nature's fireworks displays. Although it is the most spectacular, there are other forms of interest, and a few of great beauty.

St. Elmo's fire, which recently flashed from the spars and mastheads of ships in San Francisco Bay, and was taken by sailors as an omen of bad tidings, is the most eerie of Nature's strange lights.

St. Elmo's fire, or Corpse Candles, as it is sometimes called, is a common bit of Nature's fireworks in the Tropics. It is "news" only when it appears as far north as San Francisco.

Patron Saint of Sailors

Very dry weather and quantities of atmospheric electricity at different levels are the conditions needed for a night display of St. Elmo's fire. Masts and spars of ships, and sometimes steeple tops and mountain peaks, act as "brushes," somewhat like the brushes on an electric motor. They carry electricity of a different level and power than that of the air about them, and at the point of discharge emit a purplish, glowing spark, and a crackling or fizzing noise—similar to that of a faulty motor.

Sometimes before a storm, ships are aglow with carnival-like displays of those sputtering fireballs. The name of St. Elmo is an Italian corruption of St. Erasmus, patron saint of Mediterranean sailors. In Europe St. Elmo's fire is considered a visible sign of his guardianship, rather than a portent of evil.

Northern and Southern Lights

Most beautiful of Nature's pyrotechnics are the Auroras: the Aurora Borealis in the northern hemisphere and the Aurora Australis, its southern hemisphere equivalent. Each is better known under its common name; Northern Lights or Southern Lights.

Scientists are still at odds concerning the origin of its coronas, rays, arcs, criss-crosses and other discharges of red, green, yellow and blue lights that brighten the skies in the neighborhood of Hudson Bay and along the Norway coast. Mother Earth's "Fourth of July" comes twice a year, in mid-March and mid-September.

It has been observed, however, that the earth is at these times directly opposite the sun spot zones. Accordingly, it is advanced that the Auroras are the result of electric disturbances set up by sun spots. Very bright displays of Northern Lights

point, to judge from the fragments of cut stone discovered in the sea near the shore. To-day, Candia is nearing the 40,000 population mark. Its white suburbs extend far beyond the old fortifications.

Home of Sultana Raisins

Raisins play an important part in the economic life of Crete. In Sitia, in eastern Crete (see illustration), one may find upon the wharves immense golden areas of fruit drying in the sun before being packed in cases for shipment abroad under the celebrated name of Sultana raisins. Fresh grapes are exported to Greece and to Egypt. Alexandria is only 36 hours from Candia. Small steamers are busy in September and October carrying baskets of grapes to the Egyptian market.

Crete takes an important place among olive-oil-producing countries. The oil is extracted in primitive presses by the peasants and on a larger scale in factories. Much of the table oil is consumed in America.

Bulletin No. 3, March 16, 1931.

Note: See "Cruising to Crete," and "Where Ancient Sea Kings Held Sway," in the February, 1929, *National Geographic Magazine.*

© *National Geographic Society* *Photograph by Nariel Jean-Brunhes*

RAISINS LAY A GOLDEN CARPET ON THE QUAYS OF SITIA

After being treated with sulphur, the celebrated Sultana raisins of Crete are re-exposed to the sun for a single day. Special guards keep a watchful eye on the drying fruit to prevent greedy or unscrupulous persons from taking it (See Bulletin No. 3).

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County Donegal—Irish Tweeds and Steamer Rugs

IRELAND is this week celebrating the 542nd anniversary of the birth of its patron saint, St. Patrick.

One of the least-known sections of the Emerald Isle, and the scene of much of St. Patrick's missionary activity, is county Donegal, the northwest province of the Irish Free State.

Climate of Virginia

Although in the same latitude as northern Labrador, county Donegal enjoys the temperate climate of Virginia. This freedom from severe cold Donegal owes to one of the pleasant little pranks of the Gulf Stream, which washes its rocky coast with warm waters from the American tropics.

Although slightly smaller than Delaware, Donegal was in ancient times the kingdom of the clan O'Donnell. Scattered throughout the county are many interesting ruined castles of the days of the Irish kings and later struggles with the Danes and the English. Parts of the country were not conquered until the last years of Queen Elizabeth's reign.

Seat of Ancient Culture

Ireland became Christianized at a very early period and from its cultured monasteries missionaries went forth to convert many sections of northern Europe. St. Columba was born and lived in Donegal and founded several religious sanctuaries.

The county is a land of wild mountains and lakes, less than half of the surface being under cultivation. Its streams are noted for salmon and trout fishing. The coast is rocky and indented, bold headlands jutting out into the sea. Though the county has nearly 200 miles of coast line, there are no good harbors from Killybegs in the south to Lough Swilly in the north. Rye, oats, and potatoes are the chief crops of the valley farms. In Donegal cottages are woven some of the homespun tweeds for which Ireland is famous.

Boat Construction Same for Centuries

Attempts have been made in recent years to promote the fishing industry along the coast. Fishermen still use the ancient coracle, or skin boat, without keel or rudder. They are easily handled in fine weather but become extremely dangerous when surf pounds against the rocks. These primitive boats probably represent the next step in navigation after the raft and have not changed during many centuries of use. Now fine seaworthy fishing craft are being introduced.

On the north shore of Donegal are several modern summer resorts with luxurious hotels frequented by Irish and English holiday makers because of the excellent golf and sea bathing to be had there. Two of the best known of these gathering places are Rosapenna and Portsalon.

Further south Bundoran, with its scarred and weather-beaten cliffs, offers a splendid view of the sea. Here three galleons of the Spanish Armada, staggering homeward from the famous defeat in the English Channel, were washed ashore in a storm and completely wrecked. Only a few antique cannon and anchors were recovered. When Philip of Spain learned of the destruction of his supposedly invicible fleet he is said to have philosophically remarked that he had sent them against the English, not the elements.

are almost always accompanied by a magnetic storm, disrupting telegraph, cable and radio currents. Observers of Aurora displays report that some of them have a crackling sound, like the rustling of silk.

Underwater Fireworks

Phosphorescence in the sea, Neptune's fire water, has nothing to do with the substance that goes into the manufacture of matches, despite a remarkable resemblance and an obvious derivation of name. For, although sea water contains salts of phosphorus, called phosphates, it has no free, uncombined quantities of the element. Luminescence, the name preferred by recent investigators, is a more appropriate term. The light is largely the result of the oxidizing, or burning, of minute particles of dead animal and vegetable matter, the oxygen being derived from small amounts dissolved in sea water.

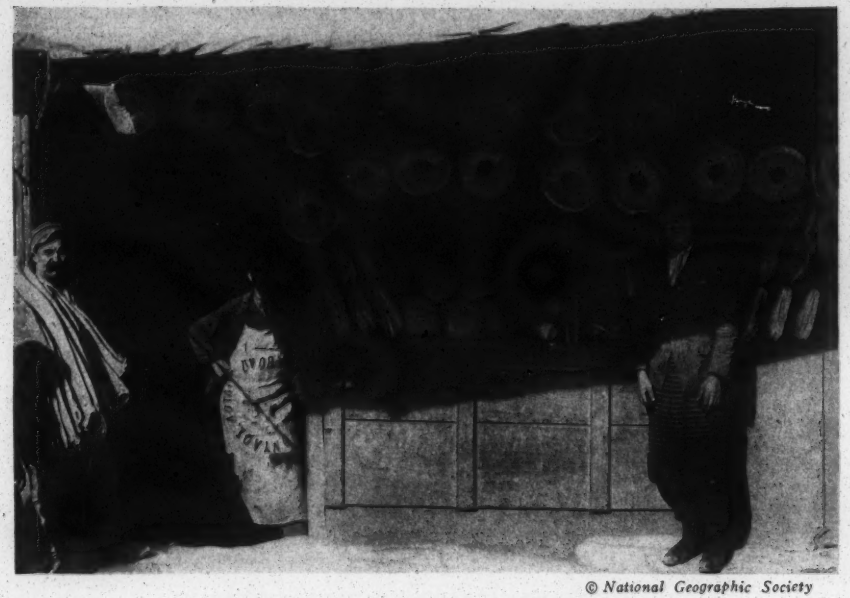
In addition, there is a phosphorescence, or luminescence, of living organisms. Several varieties of tiny single-cell plants, that float on the surface of the water, diffuse the dull glow called "milky sea" in the Far East, or "white water" of the Gulf of Aden. Certain forms of bacteria are also luminescent, and are often visible on sand and on fish cast up by the sea. This glow is not due to decay, for when decay sets in the luminescence ceases.

Lightning Without Thunder

One of the strange forms of Nature's fireworks familiar to everyone is heat lightning. Heat lightning is not lightning at all, except in a reflected sense. This soundless spectacle usually follows a flash of real lightning so far away that the sound cannot be heard nor the actual flash seen. The light is projected, like a movie, on a high strata of clouds.

Bulletin No. 4, March 16, 1931.

Note: See also "Toilers of the Sky," August, 1925, *National Geographic Magazine.*



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THE STAFF OF LIFE LIKE A LIFE-PRESERVER

These loaves of Candia, Crete, are white, firm and well-baked. Whether seasoning the bread with the dust of the highway improves it is a question! Note the Greek lettering on the apron of the baker. Crete is the largest of all the isles of modern Greece (See Bulletin No. 3).

Donegal town from the dawn of history has been the seat of the O'Donnell family. Their ruined castle, whose shell has been remarkably well preserved, is still the most interesting sight of the countryside. It remained in the hands of the O'Donnells until the days of Charles I when their line ran out and the castle passed to Sir Basil Brooke, an English Catholic supporter of the king. Donegal town is now chiefly famous for Irish tweeds and soft steamer rugs.

Inhabitants of County Donegal are noted for their courtesy and quick intelligence. Though the district is poor, hospitality is universal and beggars are rare. Country customs hark back to ancient times. It is a common sight to see women riding pillion fashion on horseback, behind the men, and bare feet are not unusual. Though lying in the far northwest of Ireland, Donegal forms a part of the Free State, its population being largely of Celtic origin.

Bulletin No. 5, March 16, 1931.

Note: Ireland, the Emerald Isle, is described and illustrated in "The Hills and Dales of Erin," and "Ireland, the Rock Whence I Was Hewn," *National Geographic Magazine*, 1927. See also "The Races of Europe," December, 1918; and "Fearful Famines of the Past," July, 1917. GEOGRAPHIC NEWS BULLETIN No. 2, week of January 19, 1931, "Where the River Shannon Flows—into Kilowatts!" offers supplementary references.

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AN 8TH-CENTURY STATUE OF ST. PATRICK

Time has nearly obliterated this sculptured effigy of Ireland's patron saint, on the Rock of Cashel (County Tipperary) near a ruined cathedral and round tower. The pedestal of this stone cross was once the coronation stone of ancient Irish kings (See Bulletin No. 5).